

# PATENT SPECIFICATION

1,062,610

DRAWINGS ATTACHED.

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*Int. Cl.*:—F 16 d /B 21 d, j.

## COMPLETE SPECIFICATION.

### Improvements relating to the Attachment of Components to Shafts.

1 We, STONE MANGANESE MARINE LIMITED,  
of Anchor and Hope Lane, London, S.E.7,  
a Company incorporated under the laws of  
Great Britain, do hereby declare the in-  
5 vention, for which we pray that a patent  
may be granted to us, and the method by  
which it is to be performed, to be par-  
ticularly described in and by the following  
statement:—  
10 This invention concerns improvements re-  
lating to the attachment of components to  
shafts, especially but not exclusively marine  
propellers to propeller shafts. Another  
especially useful application is the attach-  
15 ment of drive pulleys to shafts. A particu-  
lar object of the invention is to achieve an  
effective and reliable interference fit for the  
purpose of attaining a high torque-carrying  
capacity without the use of mechanical  
20 attachment or locking means.  
According to the invention, interference  
between a component with a tapered or  
parallel hole and a shaft of complementary  
shape is produced by swelling the shaft  
25 within the said hole with the assistance of  
means comprising a pin which has a slight  
taper, suitably between 1 in 30 and 1 in 70,  
and is fitted into an axial bore having a like  
taper and extending in the shaft for sub-  
30 stantially the length of fit between the said  
hole and shaft, the pin being provided at  
its outer end with a fine thread, which is  
engaged in a complementary thread in the  
bore, and being also provided with passages  
35 which communicate with grooves at the cir-  
cumferential surface of the pin and through  
which hydraulic medium at high pressure  
is admitted at the same time as the pin is  
40 screwed into the bore. As the pin is  
screwed in simultaneously with the supply  
of the said medium, the latter is sealed with-  
in the bore to swell the shaft within the

hole in the component and give the re-  
quired interference. When this interfe-  
45 rence, which can readily be determined by  
measurement in known manner, has been  
achieved, the hydraulic pressure is relieved,  
leaving the component attached to the shaft  
with a predetermined interference fit. To  
50 remove the component from the shaft, hy-  
draulic pressure is applied through the pin  
and the pin is screwed out. The compon-  
ent can then be withdrawn from the shaft.  
Both for attachment and removal, the use  
55 of the hydraulic pressure ensures that only  
a relatively small moment is required for  
turning the pin and a conventional fine  
thread can be employed.

One manner of carrying the invention into  
effect will now be more fully described by  
60 way of example and with reference to the  
accompanying drawing, which is a longi-  
tudinal section through part of a shaft 1  
and a component 2 attached thereto. The  
component 2 might be the hub or boss of  
65 a marine propeller, in which case the shaft  
1 would be the propeller shaft. The com-  
ponent 2 might alternatively be the hub of  
a belt or chain pulley and the shaft 1 a  
driving or driven transmission shaft. The  
70 hub 2 is mounted with a tapered hole 3  
on a tapered end portion 4 of the shaft 1.

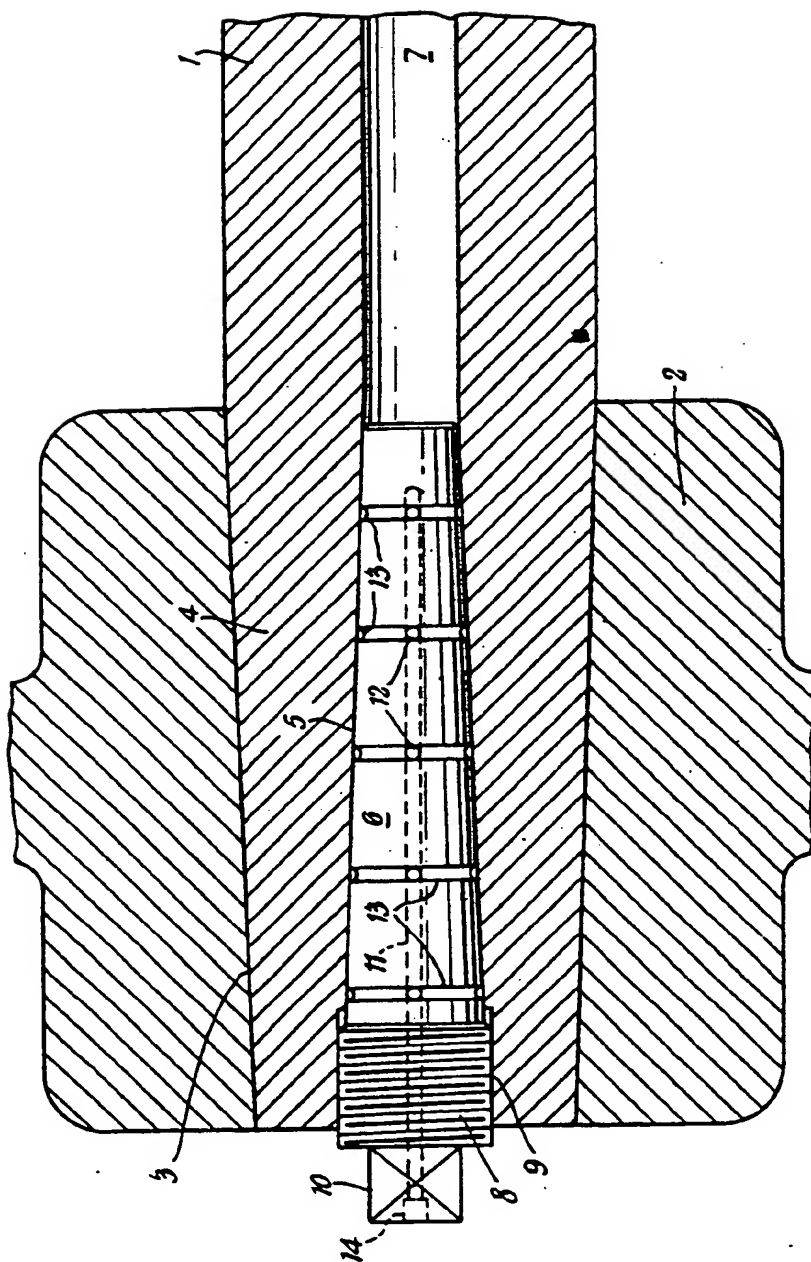
Inside the tapered portion 4, the shaft 1  
has a tapered axial bore 5 which accom-  
75 modates a pin 6 having the same taper. A  
good machine finish should be provided on  
the bore 5 and pin 6. As illustrated, the  
tapered bore 5 runs into a cylindrical bore  
7 extending through the shaft 1, but it may  
80 have a closed, radiused, inner end. At its  
outer end, the pin 6 is provided with a fine  
thread 8 which is screwed into a comple-  
mentary thread in a recess 9 at the outer  
end of the bore 5. For turning the pin 6,

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*



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